

## Rasch Model Analysis for Malaysian Internet and Sexual Activities Inventory

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### Abstract

Malaysian Internet and Sexual Activities Inventory (MISAI) was developed to measure individual differences in the tendency to be sexually preoccupied involvement using internet as a medium. We examined the psychometric properties of 23 items MISAI with sample size of 648 using the Rasch rating scales model. The results showed that the items of MISAI spreading covered a broad range of the latent continuum cybersex involvement. All items were functions in the same intended positive direction. Items appeared to unidimensionally measure the severity of cybersex involvement. Items fit the Rasch model well, with low involvement in cybersex reliably proceeding to higher involvement in a potential progression toward increasing levels of severity of preoccupied involvement. All five responds categories were functioning from never true to always true indicating of the participants' involvement in cybersex. The items fall within the infit and outfit cut-off values with an exception of one item. There were 55 misfit persons, yet the person and item showed high reliabilities. Scrutinizing the items and persons misfits, explanations are provided for practical use of this instrument and implications for future research direction, this paper are then suggested.

**Keywords:** Rasch, Cybersex, Online Sexual Activities And Psychometric Evaluation, Hypersexual

### Introduction

In recent years, there has been an increase in the number of investigations into hypersexual activities that includes excessive and uncontrollable sexual fantasies, urges, and behavior (Womack, Hook, Ramos, Davis, & Penberthy, 2013). Hypersexuality is used as an umbrella term to describe excessive sexual behavioral pattern in research and clinical practice (Klein, Schmidt, Turner & Briken, 2015). Simultaneously, internet medium is receiving considerable attention among researchers, who have estimated that the level of internet addiction among the youth varies considerably from country to country. Despite very few people use internet excessively for sex activities (Griffiths, 2012), Malaysia's level of social networking activity has shown an exceptionally high level of engagement. In 2010, Malaysia was number nine in the world and in terms of the number of Facebook users, the country is ranked third highest in

the Asia Pacific region (Almadhoun, Dominic, Dhanapal, & Woon, 2011). In 2016 Reuters Institute Digital News Report has shown an alarming statistic that ranked Malaysia as the highest in world in using social media. In 2016, Malaysia has 159,275 children out of wedlock; 14,627 cases with a total loss of RM1.09 billions of scammed online love and ranked as the highest percentage use social media, yet very few studies conducted on cybersex in Malaysia (Hawafi, Hassan & Ayub, 2015).

To some people, cybersex is a complimentary for offline sex, to others, it may become a substitute to their offline sexual activities (Griffiths, 2012). Accordingly, combining hypersexual behavior and internet addiction are considered crucial to measure cybersex in Malaysia. Cybersex has been defined as using internet for sexual purposes (Ghoroghi & Hassan & Ayob, 2016). In tandem, we developed Malaysian Internet and Sexual Activities Inventory (MISAI) to measure individual differences in the tendency to be sexually hyperactive using internet as a medium.

An earlier concept on cybersex /internet sex addiction was considered as a type of internet addiction: (i) cyber relationship addiction, (ii) net compulsion, (iii) information overload (iv) computer addiction (v) and cybersex addition (Young et. al, 1999). The previous available instrument that measures sexual and internet addiction were developed based on *Diagnostic Statistical Manual of Mental Disorder –IV* (DSM –IV, American Psychiatry Association, 1994) (Nicholas and Nicki, 2004). However, current version of *Diagnostic Statistical Manual of Mental Disorder –V* (DSM –V, American Psychiatry Association, 2013) include a new category of hypersexual disorder in a diagnostic criterion for sexual addiction. The key items for diagnostic of behavioral addiction are tolerance and withdrawals. Tolerance relates to a need for increasing more intensity of sexual behavior for the desired effect and diminished desired effect of same level of intensity. Important social, occupational or recreational activities are given up or significantly reduced because of the time spent on sexual activities.

The typical approach to measure cybersex is to ask about the frequency of individual engaged in a specified time period and then to sum these frequencies of the agreement to form a total cybersex addiction index (Cooper, Delmonico ,Griffin-Shelley, & Mathy, 2004). This index is presumed to cover a continuum ranging from leisure online sexual activities to severe problems. In this kind of scale, all items are considered to contribute equally to the total score. Accordingly, no consideration is given to the severity of each activity or engagement in cybersex as reflected by each item. Most of the psychometric evaluation of these measures to date has been limited to methods from classical test theory. Indices of an instrument reliability and validity based in classical test theory, such as Cronbach alpha for internal consistency analyses, principal component analysis to explore the underlying dimension and confirmatory factor analyses for the latent variables are primarily rely on omnibus statistics of mean score across levels of individual variation. This classical test theory application to validate instrument can be influenced significantly by sample characteristics. The analyses from classical theory neither directly address the relative severity of individual items beyond the simple frequency of endorsement nor the quality of the items as a function of different levels of the construct being measured.

The Rasch model is one particularly appealing method for analyzing item responses to learn more about the performance of scales and latent constructs. The Rasch model, which has

been described as the only method to “transform raw data from the human sciences into abstract equal-interval scales” (Bond & Fox, 2001, p. 7), is a logistic item response model that independently scales the endorseability of both items and persons along a theorized underlying latent continuum. The odds of an individual endorsing a given item is seen as a function of both the individual’s overall level of problem severity and the severity of that item (Wright & Masters, 1982). The Rasch model scales both items and persons using the same metric, an *equal interval logit scale* (i.e., log odds scale—hence the term *logistic*). Logit units accurately reflect the true magnitude of the difference between two proportions.

### **Purpose of the study**

To date, there is no instrument developed based on current Malaysian context of highly engaged in internet as a medium for sexual activities. Despite there has been uproar of Malaysian media on internet and sex addiction (Dawum, 2016), there is lack of scholarly evidence to support claim on the widespread of the phenomenon. Similarly, in other countries, the existing evidence is based on unsound instrument and biased sampling techniques (Nicholas and Nicki, 2004). In addition, there is a very limited instrument that measure cybersex activities have been tested for its validity using Rasch model analysis. As a part of our national project study, Fundamental Research Grants Scheme. Therefore, we aim to provide evidence of the psychometric validation for Malaysian Internet and Sexual Activities Inventory (MISAI) using the Rasch measurement model. Specifically, the objective if the study is as the following:

- (i) to examine whether the 23- items of MISAI spreads from non-involvement to preoccupied involvement in cybersex
- (ii) to assess the levels of respondents’ endorsement on their involvement in cybersex
- (iii) to verify the utility of 5-points rating scales in MISAI
- iv) to test the reliability and the fit-statistics of 23- items of MISAI
- v) to test the reliability and the fit-statistics of 648 respondents on MISAI

### **Method**

#### *Participants*

A total 642 samples were randomly selected using cluster random sampling techniques from Malaysian schools. There were 352 females and 290 males. The participants’ age was ranged between 13-19 years old. There were 115 aged between 13 to 15 years old, 159 aged between 15 to 16 years old, 280 aged between 17 and 18 and 100 aged between 18 and 19 years old.

#### **Procedure**

For data collection, the following procedures were administered. First, consent letter from the head department of the first author to conduct on the topic of research. Second, a permission letter from the principals of the participating schools. Third, seek help from counselor to distribute the questionnaires and collect from the participating students. Finally, a token of appreciation to the students were given to the participants.

#### **Data Analysis**

The Rasch model adopted for the analyses of the cybersex measures of the current study was the Rasch rating scale model (RSM), which is appropriate for analyzing a 5-point scales item responses. In this Rasch model, the response probabilities of each person to each of the

individual items are modeled as a logistic function of the latent cybersex trait ( $\gamma$ ). The test of infit evaluates the consistency of item parameters across the person measured for each item. Data is combined across all items to provide an overall test of fit. On the other hand, the test of outfit shows the collective agreement for all items across persons. This is to support that item difficulties are consistent and stable (Waugh, 2001). Both item and person estimates allow researchers to determine how well an item measures a latent construct. The model yields person and item cybersex estimates, as well as estimates of a set of between response category (5-points) thresholds common to all items. Item estimates  $<0$  are relatively easy for the sample to endorse, corresponding to lower involvement in cybersex; item estimates  $>0$  indicate higher involvement in cybersex. The 5-point usefulness and the dimensionality of the instrument were assessed using both Rasch fit statistics  $<0.6$  indicate items that overfit the model, i.e. the items share the almost same meaning with other items. On the other hand, fit statistics  $>1.4$  indicate underfitting (or erratic) items, i.e. the item is too unpredictable to produce meaningful instrument. Although values range for both infit and outfit mean square fit statistics depends on testing situation and measurement purposes (Wright, 1994), an acceptable range for this study is .60 to 1.40.

## Result

### Item-Person Map

#### *Research objective 1: The spreads of 23-items MISAI*

To answer the first objective of the current study, item-person map was analyzed. The item-person map is considered as central to Rasch measurement (Bond & Fox, 2007). A unique advantage of Rasch analysis lies in graphic illustration of the items locations and persons on the same interval-level measurement scale. Since measures of items and persons are calibrated on the same scale, it provides evidence on item difficulty endorsement and person agreement simultaneously. On the right side of the map, the locations of the items are spreading along different levels cybersex ranging from -1.41 to 1.30 as shown in Figure 1. The finding provides evidence that the 23- items MISAI measure different progressive levels of cybersex involvement and covers a small range of from non-involvement to some extent of preoccupied involvement in cybersex.

#### *Research objective 2: The levels respondents' involvement in cybersex*

On the other hand, the map also provides evidence the majority of the students' low involvement in cybersex. Figure 1 shows the item-person map indicate the levels of items in MISAI are far more difficult for the students to endorse their agreement on involvement in cybersex. The left side of the map shows the location of the majority of students are spreading  $<0$  that indicates under-involvement of cybersex. The value range of spreads from -4.09 to 2.92 indicates there are extreme respondents from minimum scores (23/115) to almost maximum total scores (113/115).

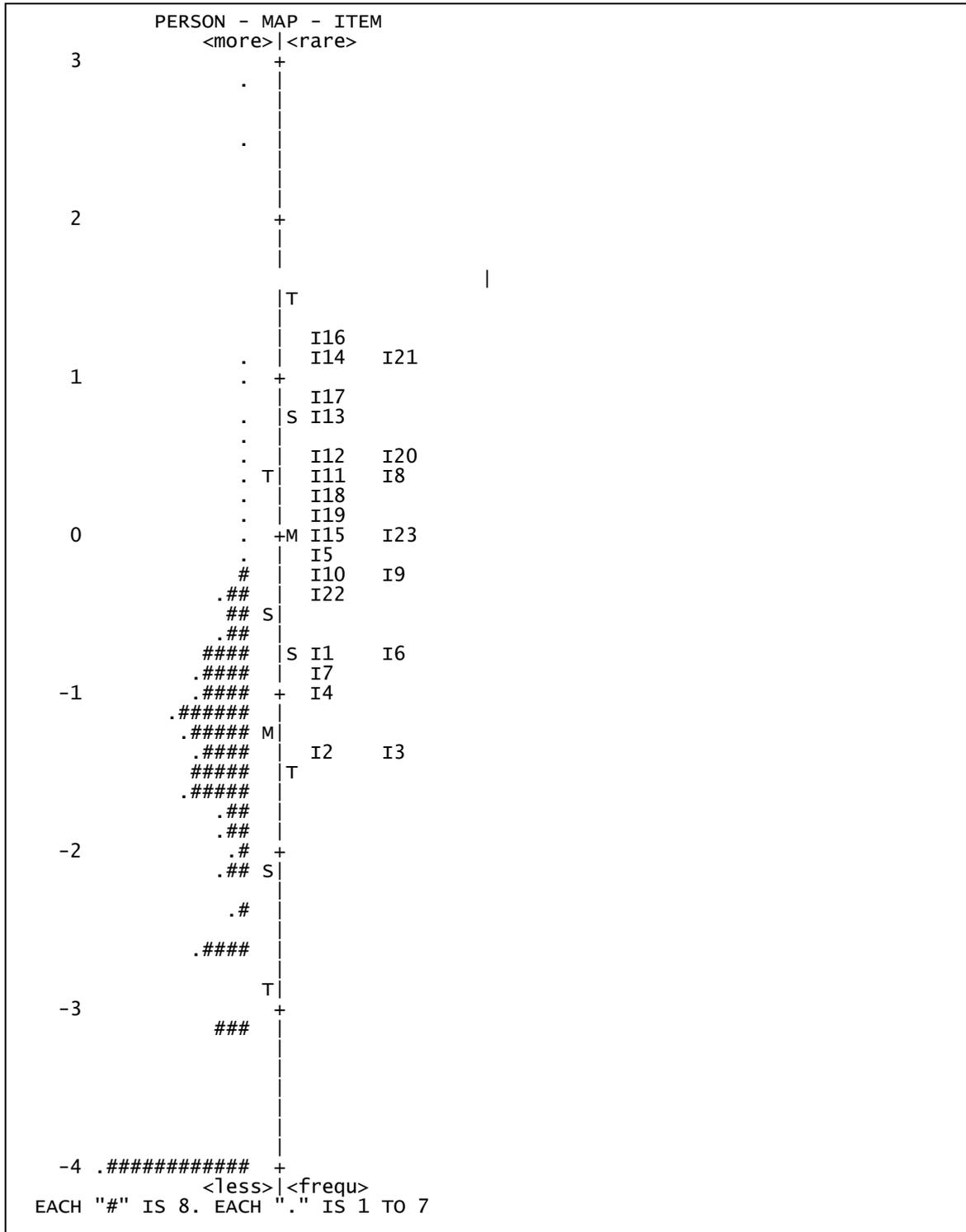


Fig. 1 Item-person map of the 23 items of MISAI with 648 participants

Figure 1: Person-Map Item of 23-Items MISAI with 648 respondents

*Research objective 3: Utility of Response Categories*

According to Bond and Fox (2007), we investigated the utility of the 5-points response categories in MISAI. The category probability curves in Figure 2 portrays that each category emerged as a peak beside categories 1 (never true) and 5 (always true). Category 4 was the highest peak, followed by Categories 3, and 2. The findings provide evidence that these three

categories may be distinctive function and a may not need to collapse rating scale categories as suggested by Bond and Fox (2007).

### **Reliability Estimates**

Objective iv: the reliability and the fit-statistics of 23- items of MISAI

Objective v: the reliability and the fit-statistics of 648 respondents on MISAI

In Rasch measurement model, high item reliability shows a spread of items in MISAI from low to higher involvement in cybersex. Similarly, high person reliability indicates MISAI administration spreads person scores from higher to lower level. A cut off value for acceptable item and person reliability must be above the threshold of 0.8. The finding of this study, item and person reliability estimates were 0.91 and 0.85, respectively, both could be considered as acceptably high.

### **Discussion**

The results showed that all items of MISAI are functions the same intended positive direction ranged between 27-.75. Items appeared to unidimensional measure the internet and sexual activities with raw variance explained by measures 55.0%. Items spreading covered a broad range of the latent continuum of severity of cybersex. As shown in Table 1 no more than two items measuring cybersex at the same level of probability of endorsement. Items fit the Rasch model well, with less severe online sexual activities reliably preceding more severe sexual activities in a potential progression toward increasing levels severity. All items fall within the infit and outfit cut-off values .60 to 1.40. with an exception of one item. "Item 22: I have been rape" showed exceed the cut off out-fit values. This result is expected due to the inclusion of item through research and practice indicates that person who has been rape may likely to be hypersexual. However, being rape is explaining another people behavior towards client. Thus, we suggest to exclude the item in the total score of cybersex measures. However, the inclusion of the item is still needed for researcher to examine the likelihood of being highly engaged in cybersex due to previous experience of being raped. The results also show there were 55 misfit persons, yet the person =.85 and item show high reliability =.91. In conclusion, MISAI is a reliable and valid instrument that measure internet and sexual activities. The items of MISAI cover different levels of cybersex from normal activities to hypersexual-compulsive activities in progressive manners.

### **Implication**

Malaysian youth, in general, the results suggest that Malaysian students are not fit to be categorized in the level of preoccupied involvement of cybersex measures. This is in line with previous research shows than less than 10% were in high involvement (Nichols, & Nicki, 2004; Griffiths, 2012; Hawafi, Hassan & Ayub, 2015). A substantial amount of them were still "pure". Future research may collect sample from rehabilitative centre of hypersexual youths that are expected to be in the category of preoccupied level.

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